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SPACE ASSET MODELING FOR WARGAME INTEGRATION

BY

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examined; space asset wargaming is approached from the viewpoint of supporting national policy. Since wargaming develops leadership skills and provides a degree of education to leaders, emphasis is placed on the ability of wargames to convey a sense of national priority. The possibility of creating a wargame suitable for all communities versus the addition of a module of a space package into any existing wargame was examined. Finally, a description of necessary components and human interface to a space module in a wargame are examined and a recommendation for effective operation is provided.

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SPACE ASSET MODELING FOR WARGAME INTEGRATION

AN INDIVIDUAL STUDY PROJECT

by

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SPACE ASSET MODELING FOR WARGAME INTEGRATION

CHAPTER I

INTRODUCTION

Space is a medium for operations of national importance, and awareness of its usefulness is rapidly dawning on world leaders, civilian and military. The satellites and associated ground equipment of the United States and the Soviet Union are indispensable resources. Satellites alone are a small segment of this complex medium; "space assets" is a more appropriate term for discussions referencing satellites and their utility. Space assets include satellites, anti-satellites, ballistic devices, ground-based support stations, and control stations. As this system grows, so does its many uses as ideas spring from existing technologies. With space systems used for navigation, communication, environmental awareness, reconnaissance, nuclear burst detection, and tactical warning, commanders at all levels must appreciate how space assets influence their missions and activities.

Commanders have traditionally learned warfighting techniques through some type of exercise training program. Learning the effective utilization of space assets should be no different. Wargaming, using models which incorporate space assets, could have an enhancing effect on our leaders' understanding of strategic, operational and tactical capabilities.

With the National Command Authority's (NCA) ever-increasing dependence on utilizing space-based systems for a wide variety of

needs, attention to catastrophic failure of space systems must also be given a high priority. Failure of a space system may occur through wartime efforts of an enemy or through natural causes, be it predicted or unexpected. Wargaming the potential impacts of the loss of space systems and the benefits of having those systems may provide an exceptional learning opportunity during a peacetime environment. The ability to integrate the knowledge of space assets and their characteristics into existing wargaming models is the thrust of this paper.

This paper will explore the feasibility of including space assets into the various computerized wargaming models used in the Department of Defense (DOD). There is no attempt to argue for a unique computerized wargame which would display the capabilities of space assets. Rather, this paper presents the idea of a space module which could be included in existing games. There are many different wargames and simulations used across the defense community and it is financially unrealistic to replace existing systems for the sake of gaming space assets.

Since the author is not a computer programmer nor a professional wargamer, this paper is limited to defining the application of space assets into existing wargaming models. It is recognized that further studies may be necessary as the refinement process continues through practice and application of space gaming. This paper will illustrate the advantages of including space in gaming techniques. The principle advantage is education for the user of the wargame, whether the game players be the most senior DOD leaders or action officers as they develop

and work the real space issues. It is believed that wargames which incorporate space assets in their models may produce dramatically different results than those games which fail to model space assets and their impacts.

CHAPTER II

SPACE POLICIES, OBJECTIVES AND DOCTRINES

U.S. SPACE POLICY

Former President Reagan understood the importance of space in support of U.S. national objectives. In his January 1988 statement of National Security Strategy, he said that the United States must maintain a lead in the space race. The goals needed to be achieved are: 1) strengthen U.S. security, 2) space related activities to increase quality of life, 3) international cooperation needs promotion, 4) all nations must honor freedom of space used for security and welfare, 5) governments should encourage private sectors to venture into space, and 6) human presence in space should increase.[1] The President's goals show significant emphasis and vibrant concern towards the utilization of space.

President Reagan further highlighted his military space policy as: 1) all military commanders must have critical space assets available, 2) free access to space should be similar to access to the earth's oceans, 3) the military should share space knowledge with non-military activities, 4) space systems must deter attack, against itself as well, and 5) those space systems which help the military forces must improve effectiveness.[2]

As Secretary of Defense, Mr. Carlucci took the President's broad guidance and strongly stated concern for space control. He said that integrating space operations with military doctrine and strategy will be a significant challenge. Space is as

indispensable a medium as land, sea and air are to support total objectives. U.S. policy will seek to: 1) enhance deterrence, 2) retain free access to space, and 3) enhance U.S. operations in space.[3] Mr. Carlucci added that to achieve controlled space, the United States must: 1) maintain appropriate land and space-based systems capable of continuous monitoring, 2) develop an effective anti-satellite program, 3) provide allied satellite self-protection, and 4) secure a complete satellite command and control capability.[4]

Secretary of the Air Force Edward C. Aldridge, Jr. also endorsed the emphasis of the NCA on space. He stated that U.S. space policy must contribute to deterrence and defense. Further, he said that a fundamental goal of the U.S. national security space program is to maintain assured space operational capabilities.[5] The U.S. civilian leadership's national security space policy is clear: we must move forward and gain an absolute superiority in space.

SOVIET SPACE POLICY

As the Soviets maneuver following the Intermediate-range Nuclear Forces Treaty through strategic nuclear arms, conventional arms and space weapons negotiations, U.S. leaders must view Soviet statements cautiously. Despite the Soviet's stated goal to strengthen the Anti-Ballistic Missile (ABM) Treaty, they have shown a strong desire to constrain all U.S. efforts in the Strategic Defense Initiative (SDI).[6] The Soviets integrate their

space systems into their warfighting capability. They continue along a rigorous schedule of launches and technological updates. As their budget indicates direction or intensity of their program, it is a serious concern that the Soviets plan to spend a considerable amount of money on space programs during the next five years.[7]

An important aspect of Soviet space policy is their ability to keep man in space continuously, which they have effectively demonstrated for a number of years.[8] Their doctrine advocates a need for humans in space to accomplish remote sensing and investigate oceanography, meteorology and geology. With their continued refinements and advances, they are developing the capability to stabilize platforms and orient equipment accurately, with minute precision for military application of directed-energy weapons.[9] As the Soviets attempt to maneuver around the United States in space technology, they are developing considerable technologies to create effective space weapons to attack satellites or ballistic missile warheads.[10]

U.S. AND SOVIET SPACE POLICY COMPARISONS

Americans have maintained that despite Soviet efforts in space, the U.S. program is better or more effective because of higher quality and technological superiority. Regardless of historical comparisons, the Soviets are definitely serious about their utilization of space. Their entire philosophy for space systems is driven by military considerations. A measure of this is the response time to deploy assets; they measure theirs in

hours while we measure ours in months for similar U.S. systems. The Soviets have continued to sustain an annual launch rate of about 100 per year for the last decade.[11] U.S. launch rates during that same period has eroded to an average of less than twenty per year.[12]

The higher launch rates which the Soviets achieve have a direct impact on their ability to launch necessary space systems during a crisis in a much more responsive manner than the United States. The nearly continuous Soviet man in space has significantly increased their opportunity to proliferate experiences gained in sustained weightlessness, something the U.S. space program may be seriously lacking.[13]

A major philosophical difference between the U.S. and Soviet space programs is in the method of creating new generations of space assets. The United States tends to leap in long strides from one generation to the next. The Soviets prefer an incremental approach to changes, thus producing systems which maintain a rather long life. Some booster rockets the Soviets recently used were derivatives of those used in 1957. The downside for the Soviets using this type of philosophy is that their system reliability is lower than that of the United States.[14] This is especially true and significant for the early launch warning and communications satellites as they lag significantly behind U.S. technology. On the other hand, living with those reliability levels results in the increased launch frequencies earlier

discussed. Summarily, simple comparisons between the two countries' capabilities and policies may be misleading.[15]

An overall statement of policy emphasizing hardware capabilities would indicate that the Soviets prefer less durable systems which require a more frequent replacement rate. The U.S. policy appears rather opposite by relying on more sophisticated systems which last longer and then require a significant technological improvement for its replacement.[16]

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CHAPTER III

WARTIME APPLICATIONS OF SPACE ASSETS

WARFIGHTING APPLICATIONS

Transitioning from policies, objectives and doctrines into a reasonable assessment of space wartime activities is a prerequisite to designing any possible simulation of space assets. Militarily, space is just as significant a place to support conflict or other security interests as the traditional three mediums the world knows so very well; land, sea and air.[17] The United States uses space assets as a medium for the monitoring of Soviet military capability. Although the Soviets similarly collect data, the United States has to rely more on space for this type of information. This includes the ability to sense when either side has launched a missile attack against the other.[18] The communication of salient information is another militarily important function of space assets which both sides would characterize as vital during any conflict.[19]

Any conventional conflict between the superpowers would be characterized by strict command and control arrangements within and external to the theater of conflict. As the abundance of meteorological and geophysical information pours into command centers, senior leaders would collate this with other intelligence and targeting data to provide subordinate eschelons direction and guidance for combat never before available to field leaders.[20]

The U.S. Army addressed the above battlefield concerns through their manuals, but they are not alone. Joint doctrine and other services' doctrines also clearly address the indispensability of space assets. The U.S. Air Force's basic doctrinal manual describes wartime missions in a manner similar to those described by Army planners. There is a common denominator of the absolute requirement of U.S. space assets in the effectual engagement of U.S. forces against any enemy.[21] Besides these military needs, the U.S. Navy places enormous reliance on space systems for their broad ocean navigation with the Navstar Global Positioning System (GPS).[22]

DEGRADATION AND ESCALATION

Because space-based systems often replace other systems as the most effective method of accomplishing a mission, the U.S. needs to continue using space systems in its endeavor towards deterrence. Space has gradually become the only medium in which some important security or defense functions can be accomplished. Successfully maneuvering around the Soviets has required a real advantage in technology. The United States continues to maintain an advantage in this maneuver competition but this means a strong and continuous dependence on space technology.[23]

A case in point is the surveillance of a battlefield which space-based platforms so efficiently manage. A key to senior leaders' ability to send the correct forces to the right location is knowing the enemy's position and fortifications. Although terrestrial systems can provide this data, space systems greatly

enhance the speed by which the information can influence decision making. With U.S. dependence on such systems, the Soviet's ability to eliminate or blind our systems becomes a dramatically important leverage component.[24] The entire DOD intelligence community focuses on space systems for their collection to provide commanders essential information. The support structure is increasing and a movement to further expand the intelligence network continues.[25]

This leads to a discussion of anti-satellite (ASAT) weapons in the role of destabilizing efforts towards deterrence. It is important to reflect on Soviet doctrine which emphasizes their belief that mastering space is absolutely critical to winning any conflict. Senior U.S. leadership recognizes the Soviet's intent to control space through their ASAT program. The U.S. must become more active in that arena to maintain the balance.[26]

Current ASATs do not pose a threat to all satellites because the current ASAT systems can only attack objects close to the earth's surface. The United States could potentially attack satellites in low or Molniya orbits while they are traversing near their perigee.[27] Soviet capabilities for a Molniya orbital attack are not currently assessed as possible.[28] Although these statements seem to suggest that the United States has an advantage in the ASAT race, nothing could be further from the truth. The U.S. ASAT potential is the rocket launch from an Air Force F-15 at high altitude. The Soviets utilize SS-9 ICBM boosters and launch pads which can be rapidly refurbished.[29] The United

States has no system capable of matching the Soviets. The F-15 platform is merely a capability which has been demonstrated only once, but it is not operational.[30]

As countries place more emphasis on space-based platforms for military or national interests, they stand to lose more if an enemy has the capability to destroy those assets. On a comparative scale, the United States currently has much more to lose from an ASAT attack than do the Soviets. The reason rests in the fact that the United States is gathering much more information about the Soviets from space assets than the Soviets similarly gather about the Americans.[31]

It is not likely that a world power would use an ASAT in peacetime despite satellites being away from native soil and no fatalities would occur from an ASAT attack; an attack would certainly invoke retribution.[32] In the extreme case of full scale nuclear war, satellites would play a vital role in the opening minutes of the exchange, but their utility would dramatically fall as the holocaust unfolds.[33]

The transition period between peace and war, or possibly the development of a regional conflict, may be the most likely time for ASAT usage. Some of the potential attacks might be against those satellites which, if destroyed, would blind the enemy from gathering essential intelligence data about large naval movements, supporting AirLand Battle formations, or other land-based targets of importance.[34] Predicting the advantage is difficult because capitulation of capability would certainly not occur since alternative methods and work arounds exist. The highly

provocative nature of the attack might cause an escalation in the conflict.[35]

As President Reagan's space objectives become reality, the military space community must exercise greater vigilance than in previous years. As more segments of society actively participate in space activities, technologies are sure to leap forward with exponential growth. New categories of weapons might develop and be controlled by any one of numerous organizations or countries entering space. National leaders must keep pace with this growth and always maintain a guard against opportunists who have other than honorable intentions such as blackmail or space terrorism.[36]

With policy and guidance from U.S. national leadership, the Commander-in-Chief of U.S. Space Command (USSPACECOM), General Piotrowski, recently appealed to leaders of the highest military commands and staffs for a joint educational effort to ensure senior officers have a better understanding of space terminology and capabilities.[37] Space and its systems were once an imaginative dream in the minds of astronomers and a few military scientists. Today's military leaders are constantly working with space assets in a very transparent manner.

Today's battlefield is not the traditional geographic dilemma which tested past military leaders. With all the many space-based systems enhancing a commander's decision-making ability in an enigmatic way, a battlefield or theater commander must possess a fluent knowledge of satellite capabilities. The U.S. Army recently realized the need for such education and joined the uni-

fied command, USSPACECOM. The Army leaders recognize spatial impacts and the importance of knowledge within their ranks. Scientists have made the systems so easy to use that commanders do not realize they are using space assets. A major problem could exist if those same leaders can not infer the impact of a catastrophic system failure on their battlefield operations.[36]

Battle management is a fast-growing technology which relies heavily on the ability to transmit real time intelligence data to national leaders in an understandable format. Satellites and related hardware are obviously needed to provide this type of essential information to future warriors. A distinct advantage which battle management has over previous schools of warfighting rests with computerized simulations of a battle. Since entire wars can be simulated and fought in the comfort of air conditioning, this entire process lends itself very well in educating national leaders.[37] Gaming space systems into any battle would certainly heighten the awareness of space in the minds of military leaders.

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CHAPTER IV

WARGAMING

DEFINITIONS AND LIMITATIONS

Since fighting a war is not a practical method for members of the armed forces to learn the most effective way of fighting, some non-violent means is necessary. Training and education programs deal with this in a number of ways. Hands-on training is typically conducted in an exercise format. Exercises can also be used for military leaders by placing them and their immediate staffs in their control center or command post environment with a control group presenting pre-coordinated problems in a controlled sequence.[40]

A drawback of this method is the inability of the players to fully understand the impacts of casualties or losses of major hardware components. Simulations and wargames fulfill the need of portraying catastrophic impacts without them actually occurring. Simulations are representations of certain features or attributes of combat which can be measured with some degree of probability.[41] Simulations run rather automatically once the game parameters have been stipulated. Simulations are adaptable to computer models which may be capable of accomplishing vast amounts of probability calculations in a short period of time.

Wargames are similar to simulations but include some components of battle staff exercises whereby people have an active role throughout the duration of the game. A wargame is a type of simulation but has a continuing human dimension. Time is a

factor and decision makers periodically intervene as feedback mechanisms provide data and the leader desires actions which may not be automatically assumed.[42] A drawback of wargaming is that considerable time must be allotted to its design and development, and to each execution.

The best of all worlds is probably a hybrid of a wargame and a simulation with the simulation calculations taking place in a computer. Normally, this hybrid will achieve more reliable results as it not only accurately calculates the many combat and support probabilities, it incorporates the unexpected notions of leaders as they provide what only humans can exhibit.[43] Human judgment is then a dominant factor in the game outcome. Wargames educate leaders from patrol roles, through theater command, and even include the highest national civilian leaders. The games do not limit the player's imagination or creativity as options and strategies can be fully examined without the bitter cost of war. Existing operational plans or modifications to them can be easily tested, and the same scenario can be executed on multiple occasions to achieve the best course for the successful campaign.[44] With enough replication, a range of results can be achieved which can be used to clearly highlight acceptable and dangerous leadership decisions.[45]

WARGAMES WITH SPACE ASSETS

Very few wargames in today's vast arsenal of games contain the capability to model the effects which space-based assets

could have on the battlefield. Even the staff of USSPACECOM has very little resource to adequately model the consequence of space assets on global or regional conflicts. USSPACECOM uses the Land Engagement Model (LEM) and the Naval Engagement Model (NEM) to test space systems in a wartime scenario.[46] At the Pentagon, no wargaming of space-based systems seems to exist. In the JCS staff directorate, Force Structure, Resource and Assessment, J-8, has an office devoted to wargaming and simulating, but no space modeling exists.[47]

Another agency of the Joint Chiefs of Staff which is significantly active in simulating various scenarios using the U.S. Single Integrated Operations Plan (SIOP) against a hypothetical Soviet equivalent, the Red Integrated Strategic Offensive Plan (RISOP), is the Joint Strategic Target Planning Staff (JSTPS). They are collocated with the Strategic Air Command (SAC) at Offutt Air Force Base, Nebraska and are responsible for the U.S. global thermonuclear war plan. Despite this responsibility, the JSTPS does not model any use of space-based assets in their significantly important wargames beyond some very limited assumptions about the impact of high altitude electromagnetic pulse (EMP) events on communication systems.[48]

LEM and NEM, which are used at USSPACECOM, are simulations, that is humans have very little interface with the computer once established parameters are in the data base.[49] The U.S. Naval War College (USNWC) appears to be the only major military organization actively engaged in space warfare, with their major focus on the impact on combat units at sea.[50] Their wargaming center

uses a very sophisticated model, named NSAT, which interfaces with their existing mainframe computer supporting their wargaming efforts.[51] The highest ranking military and civilian U.S. leaders periodically meet at the USNWC to practice their wartime decision-making and discover the significant impact which space-based systems have on their strategic and operational thinking. As suggested by the attendance of senior leaders, the USNWC conducts wargames, not simulations; thus, decision-making is an essential ingredient to the game and learning process.[52]

Several agencies are attempting to include space modules into their existing wargames or simulations because the approximations of their games are futile if modeled without space considerations. The U.S. Air War College and the U.S. Army War College are both progressing towards the inclusion of space assets in their respective gaming. The Air War College currently utilizes a program called "SPADEX, A Space Defense Acquisition and Operations Exercise" which emphasizes space in support of a Southwest Asian problem, but places particular emphasis on the logistics of space programs.[53] Air War College and Army War College are attempting to educate their senior officer students through curriculum exercises which emphasize space assets and their wartime implications.[54]

During a recent Modern Aids to Planning Program (MAPP) conference at the Joint Warfare Center (JWC) located at Hurlburt Field near Pensacola, Florida, representatives from across the spectrum of DOD wargaming agencies realized the significant

shortfall in the inclusion of space-based assets in their wargaming processes. The vast majority of joint staff wargaming models lack the ability to model space activities. The Deputy Director of JCS/J-8 urged wargamers to include space in their wargames and simulations.[55]

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CHAPTER V

SPACE ASSETS IN WARGAMING

IMPACTS OF SPACE ASSETS ON WARGAMES

A pre-war attack against any component of a space system which supports the U.S. strategic role would likely have a catastrophic consequence on world stability. Operationally, ground forces commanders throughout the echelons within a theater of war may lose considerable communications, environmental data, and navigational capabilities. Naval forces could not only lose those same capabilities but also lose an offensive weapon strike accuracy because of their reliance on space-based navigational aids. Air forces' operations would suffer from all of these operational degradations. Many different types of sensors provide a stability to the environment of global politics. Removing this stability by attacking space systems may be tactically correct but strategically would endanger escalation control and battle management systems.[54]

Destroying a nation's strategic space assets would probably result in an attempt to replace them as soon as practical. Simultaneously, some form of retribution would be likely. Escalation would presumably occur; as destruction of recently replaced assets takes place, the cost of their annihilation becomes too high to ignore. Soon, the tactical targets which were far away from populated earth become the "opening of Pandora's box." Some countries have no anti-satellite

capability, so another form of retribution may involve the loss of life through terrorism.[57]

These thoughts periodically reveal themselves during the conduct of various wargames throughout the U.S. senior officer wargaming community. Classification levels inhibit disclosure of specific examples from wargames, but general conclusions can be drawn which suggest that space is an arena for warfare just as any other medium near or on the surface of the earth.[58] This does not make space a theater of war. But when wartime acts occur in space, commanders potentially lose so much capability that they would consider such an attack not unlike a direct attack on their land, air or sea forces.

At the most strategic level of warfare, global thermonuclear war, technological advances in ICBMs are placing space-based surveillance systems in an extremely important role should the unthinkable war occur. The Soviets' relatively new mobile ICBM systems, SS-24s and SS-25s, are rail and road mobile respectively and certainly cause U.S. targeteers nightmares. Space-based surveillance systems must track their locations so that U.S. strategic nuclear systems can retarget them to continue to hold those systems under threat.[59] Although not currently included in any model, this aspect of world conflict cannot be overlooked by the U.S. simulation or gaming community. Conducting a wargame or simulation without the realistic appraisals of space-based capabilities may result in grossly unrealistic results.[60]

Having discussed the very essence of space policies, the rudimentary potential of space-based conflicts, the bridge into

the fiction of wargaming, and the building of a case to include space in wargames, it is now time to address the design of a space game.

DESIGN OF A SPACE WARGAME

In the decision making process of creating a wargame or simulation which will add a model of space activities to the games, care must be exercised in contemplating the ultimate use of such a wargame. As previously discussed, a wide variety of uses for wargames and simulations exist and the inclusion of space assets in those games will only serve to enhance and increase the credibility of the model. The most obvious roles of a space wargame rest in the educational benefits to national and military leaders and, at least equally important, is the ability to test war plans, doctrine and decision making.[61]

Simulations

Since simulations lack the human interface during the calculation of the many probabilities, space asset parameters and leadership intentions must be clearly defined and input into the computer prior to the game's initiation. This does not mean that space has no merit in simulations. On the contrary, much can be learned about the relationship of offensive and defensive systems if space assets are incorporated in simulations. A simulation's entering arguments or parameters must be more carefully selected than in the case of a wargame since no corrective actions can take place during the course of the simulation.[62]

Satellites and their orbital mechanics are easy to imitate in sophisticated computer models. The capabilities of ASATs or other directed energy devices can be modeled to acceptable levels of reliability.[63] The outcome of a satellite's capability after an ASAT attack plus its impact to the network it was supporting could be calculated as part of the game. The biggest difficulty rests with the decision to use an ASAT. But simulations allow leaders the opportunity to test the "what if." This hypothetical test can be responsible for sound operational uses or plans for satellites, ASATs and associated equipment. Supplemental plans can be created for substitutions if actual degradation occurs from an ASAT attack.

There are more benefits from including space assets in simulations than merely analyzing the effects of an ASAT attack. Surveillance can be useful if it is linked with operational activities. As previously reported, Soviet shifts in their Strategic Rocket Forces to the very mobile SS-24s and SS-25s pose an interesting challenge to U.S. strategic wargamers. Prior to mobile systems, the SIOP undoubtedly targeted fixed ICBM locations.[64] Since targeteers would certainly maintain the philosophy of attacking the Soviet nuclear force, surveillance information is critically needed for the task of locating the Soviet mobile systems.

Wargames

The inclusion of space assets in wargames should be similar to that described for simulations, but the space module in the

wargame will probably be more complex. The U.S. Naval War College operates an adequate space module in their wargames and should serve as a good starting point in defining a more generalized space game. The Naval War College space game has one significant drawback; the security classification level of the performance characteristics of the space assets significantly inhibits game design to the point of playing only those assets which are in the data base. The data base is maintained by a contractor who models only the existing systems whose data are accessible by him. As currently developed and maintained, the Naval War College can not depict futuristic systems.[65]

Wargaming only current space systems is not a hindrance in providing the education which wargames must accomplish. The NWGS-NSAT used at the Naval War College has a communications interface with the wargame mainframe computer which provides an update of satellite data every six minutes of game time for aircraft and every thirty minutes for ship information. Game time can be compressed to a limit of one minute of real time equaling eight minutes of game time. The game time can be varied depending on the scenario and the desires of the players.[66]

There are many wargames and simulations currently in use and there are also several space modules available which could be included in existing wargaming software.[67] The human interface with space wargames allows for the players to thoroughly examine the battlefield through an active participation. The space wargame should provide that players update force movements, examine

surveillance and detection data, and decide allocation requirements for space activities and priorities. Following this strategic or operational level of decision making, the players must then focus on weapon deliveries and associated intercept tactics. After playing this, another critical step which a wargame should allow is target damage assessment.[56]

The inclusion of space assets in wargaming must replicate actual activity that space provides. The wargame should allow space assets to influence communications, navigation, target detection, force vectoring, engagement convergence, high value target selection, threat identification, launch platform inertial reference, midcourse guidance, and strike assessment.[57] This should apply to forces in all military mediums: land, air, sea, and space.

ENDNOTES

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57. Ibid.

58. Ibid.

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60. Austin.

61. Richard J. Wendt, Major, USAF, Space, Wargames and Displays, pp. 78-80.

62. McHugh, Ch. 6, p. 24.

63. Brewer.

64. Scott D. Sagan, "SIOP-62: The Nuclear War Plan Briefing to President Kennedy," International Security, President & Fellows of Harvard College & the Massachusetts Institute of Technology, U.S. Army War College Selected Readings, Course 2, Vol. III, p. 201.

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CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The U.S. is relying on space for a vast number of military applications which have implications at the strategic, operational and tactical levels of conflict. At the operational and tactical levels, commanders need space systems to fight the battles they may encounter during their next conflict. Combining information such as weather patterns and terrain collected from satellites can dramatically influence decisions. This applies from the battalion or squadron commander through the theater CINC.

Sea, air and land-based operational systems depend on satellite platforms to provide accurate navigation. Space-acquired surveillance information has critical importance to military leaders. Given the increasing criticalness of space systems, an enemy attack against them or their supporting earth-based systems would be as serious a blow as an attack against any U.S. military target. Escalation would be likely.

Wargames graphically portray to the players that combining subordinate commanders' losses exponentially hurt the theater CINC. Since each commander's picture of a war synergistically influences every other commander's picture as they form one big picture, the CINC could be left totally in the dark as space and other important resources are lost through attrition. With little or no reconnaissance capability plus the loss of the

space-based help which his subordinate commanders once had, the CINC is left with premonition and rudimentary forms of communication. This uncomfortable status may summon the Armageddon the United States has so strenuously avoided.

Since wargames provide the players a degree of education and allow for the testing of operational plans or ideas, the inclusion of space assets in wargames necessarily obliges a reflection on the national policy which President Reagan provided.[70] Space wargames would help fulfill national policy by strengthening the security of the United States through better educating national and military leaders in space matters. Space wargames also test and refine strategic doctrine, operational plans and tactical maneuvers.

The five basic pillars of space doctrine; space logistics, human presence, surveillance, command and control, and sound space doctrine are closely examined in space wargames.[71] The U.S. Air War College specifically addresses the logistical aspect of space through their exercise scenario.[72] The remaining four pillars are pursued by many gaming communities. Space doctrine requires considerable attention as current space philosophy is brimming with airplane mentality caused from general U.S. Air Force doctrine.[73] Space wargames allow for intense examination and improvements to doctrine.

USSPACECOM and the Wargaming Branch of JCS (JCS/J-8/NFAD) are both pursuing the goal of incorporating space modeling into their wargames and simulations. The reason for this movement towards

space asset modeling rests in the realization that without space, faith in wargaming results may not be credible. Space is a contemporary fact of life and cannot be dismissed as a futuristic dream which should be dealt with at some other point in time. Everyone uses space assets on a daily basis, and because they are commonly used they often appear transparent.

RECOMMENDATIONS

Professional wargamers must rise to the challenge of synchronizing their analytical tools with the technology and reality of modern societies and their military capabilities. Those capabilities include the ever-demanding use of space as a medium for operations. National policy, objectives and doctrine must remain completely conspicuous to strategists as they develop systems which test and evaluate the nation's ability to sustain peace.

In that endeavor, it is recommended that the entire community of wargamers take immediate measures to acquire space modules as part of their analytical assessments. The wargaming community is meant to include all those who develop or execute wargames, simulations, hybrids of wargames and simulations, and exercises.

Commanders at all levels must quickly initiate programs to educate and indoctrinate everyone in their units on the significant impact which space systems has on their everyday lives. It is recommended that commanders pursue the use of USSPACECOM's tutorial wargame as the primary means of providing this education.

It is recommended that JCS/J-8/NFAD and JSTPS/JKA immediately acquire the capability to model space assets in the simulations they accomplish in the evaluation of the SIOP and other strategic plans. These simulations must include the Monte Carlo processing of space assets' ability to provide effective communication, detect targets on land, sea or in space, reliably engage weapon systems against threats, and provide a summary analysis of damage assessment. The results of various ASAT attack simulations must be included as the ability to plan or evaluate different ASAT options is critical. Although this applies to the space portion of a simulation, existing programs and evaluation techniques must continue to be developed.

USSPACECOM/J3AN must continue their efforts of including space assets performance in their analytical tools. Since USSPACECOM bridges the entire gaming community of wargames, simulations and exercise, they are obliged to incorporate space in all their activities. Obviously, USSPACECOM is in the space business. But because they have a very limited space gaming capability, USSPACECOM strategic analysts must acquire more sophisticated techniques than are currently used.

The professional military educational institutions must become more active since existing middle to senior officers are receiving a space education based only on exercise activity. Much more benefit would be realized if these same officers were exposed to an interactive, iterative wargame which included use and manipulation of space assets. It is recommended that all

senior service schools acquire the NSAT space module which is currently in use at the U.S. Naval War College.

All military institutions engaged in wargaming must incorporate space systems into their analyses. It is not recommended that one space game be created and distributed to the world; rather, a module which could be inserted in any game is the preferred approach. Since computer programs are unique and not interchangeable, space gaming concepts must remain the common denominator and a computer language should be created to meet the needs of the user.

The ultimate use of complicated wargames which include space requires that they be a hybrid of wargaming and simulating. Military and national leaders at all levels need a wargame with the capability to interact with space systems. They must learn the limitations and full abilities of space systems with regard for their relationship to the battlefield or their operational maneuvers. Iterative ability of a wargame to replay actions would provide better learning. The following capabilities must be incorporated in any space wargame. The players must have active game input capability. Players should update force movements, allocate satellite activities based on need, inject ASAT attacks as required, provide satellite logistical support, alter satellite orbital characteristics when needed, and request damage assessment following attacks. All these capabilities of the space wargame should be available on player demand.

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